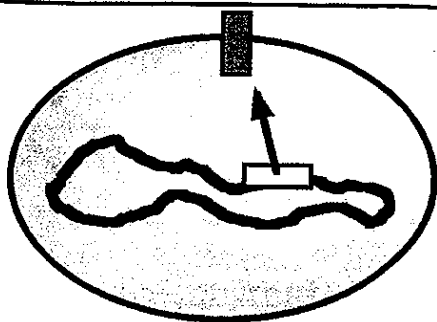


Conventional RB51 vaccine



Normal Brucella RB51 Vaccine

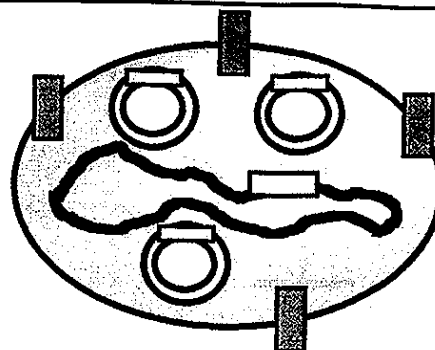
Vaccinate animals

**Animal develops
Immune response**

**Challenge with
virulent Brucella**

**Certain level of
protection**

**Novel co-expression of
homologous antigen**



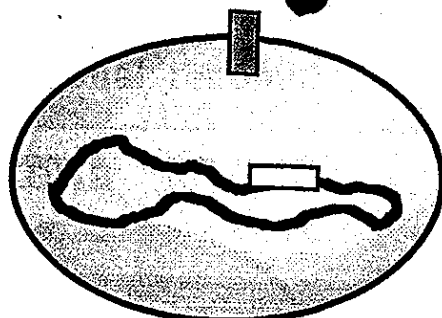
**Brucella RB51 vaccine
overeexpressing
homologous antigen ()**

Vaccinate animals

**Animal develops
Immune response
but stronger
against the
overexpressed
homologous
antigen**

**Challenge with
virulent Brucella**

**Higher level of
protection
(20x or more)**



Normal Brucella RB51 Vaccine (current vaccine)

Vaccinate animals
Low dose High dose

Challenge with
virulent Brucella

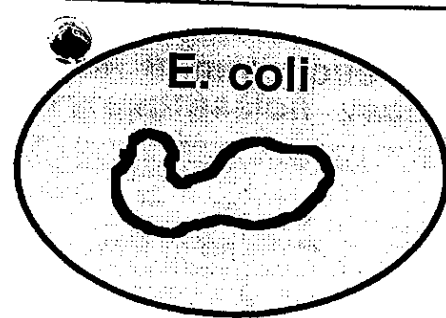
Similar protection
both groups

They tested if both groups
had an immune response to
Brucella GroEL antigen (one of
the many antigens of Brucella)

NO Antibodies YES

NO CMI YES

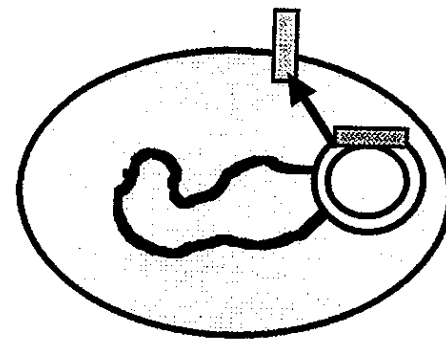
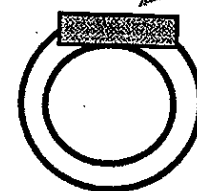
Conclusion:
GroEL is not protective



E. coli

+

Brucella gro.
gene



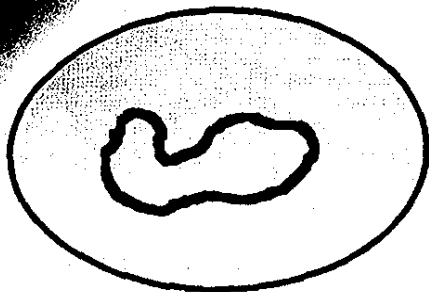
E. coli expresses
(produces) the
heterologous Brucella
GroEL

They purify the GroEL
antigen from these E.
coli and use the Brucella
GroEL antigen in in vitro
tests to determinate if
RB51 vaccination
induced an immune
response to GroEL
(antigen is never used
as a vaccine either)

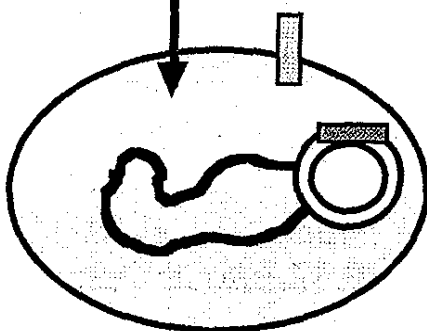
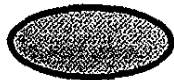
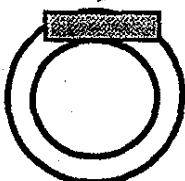
Stevens and coworker's work is not related to the overexpression of homologous antigens concept used to increase Brucella vaccine efficacy.

Conventional recombinant vaccines

Bacteria "X"



Heterologous antigen gene
from bacteria "Y"



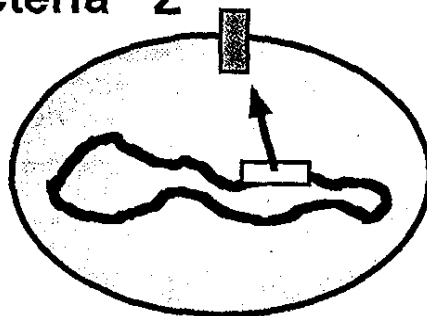
Bacteria "X" expresses
(produces) the
heterologous Bacteria
"Y" antigen



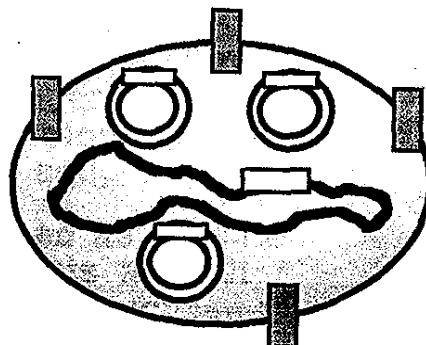
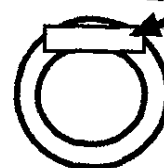
If used as vaccine
protects against
bacteria "Y" and
may be "X"

Novel homologous overexpression vaccine

Bacteria "Z"



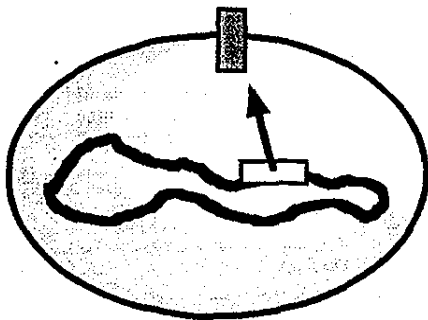
Homologous antigen
gene from bacteria
"Z"



Bacteria "Z" overexpresses
(overproduces) the
homologous Bacteria "Z"
antigen in large amounts

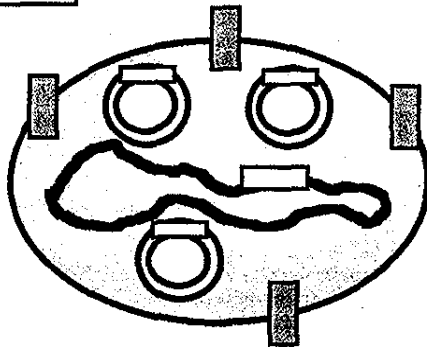


If used as vaccine
protects against
bacteria "Z" at
much higher levels

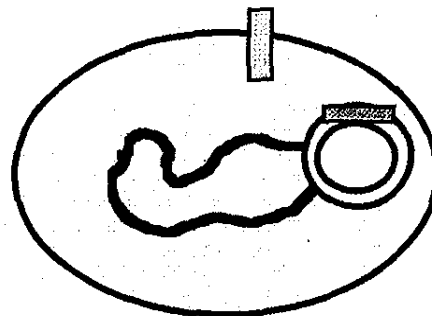
I.**Bacteria "Z"**

Protects against
bacteria Z

Contrasting Conventional recombinant vaccine expressing a heterologous antigen with our vaccine where homologous antigen overexpression is coupled to heterologous antigen expression.

II.

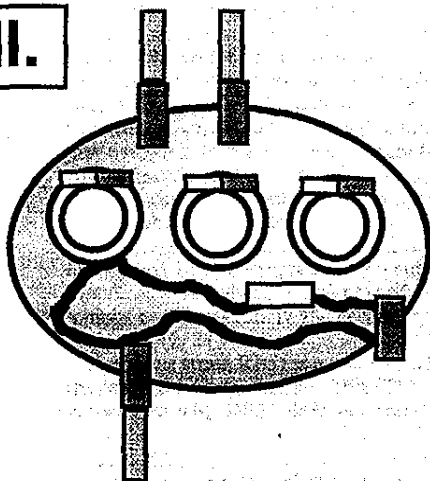
Protects against
bacteria Z much
better (20x or more)

Bacteria "X"

Bacteria "X" expresses
(produces) the
heterologous Bacteria
"Y" antigen

If used as vaccine
protects against
bacteria "Y" * and
may be "X"
(* if Y antigen is a
protective antigen)

If bacteria X
expresses a
protective antigen
from bacteria Z it
may protect but the
levels will be similar
to I.

III.

Protects against
bacteria Z much
better (20x or more)
and protects
against bacteria